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Dynamic charge susceptibility and softening of longitudinal phonon modes in cuprates

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Abstract

© 2014, Pleiades Publishing, Inc. The dynamic charge susceptibility as a function of the wave vector and the frequency has been analyzed in the context of the existing experimental data on the plasmon frequencies, softening of the longitudinal phonon modes, and charge density waves in the electron subsystem of the high-temperature superconducting cuprates. It is emphasized that a set of all experimental data can be explained only under the assumption that the interaction via the phonon field plays an important role and differs in different regions of the Fermi surface; i.e., the parameters of the electron-phonon coupling depend not only on the value of the momentum transfer q but also on the wave vector k.

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